

ANATS Regional Emissions Analysis

for the Anderson County Early Action Compact

**Anderson Area Transportation Study
October 2005**

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Executive Summary

This report demonstrates that the Anderson Area Transportation Study (ANATS) Metropolitan Planning Organization (MPO) long-range transportation plan eliminates or reduces violations of the national ambient air quality standards (NAAQS) in the MPO portion of Anderson County, South Carolina. The plan accomplishes the intent of the South Carolina Early Action Compact (EAC) State Implementation Plan (SIP). ANATS bases its regional emissions analysis on the transportation network approved by ANATS for the 2030 Transportation Plan and the emissions factors developed by the South Carolina Department of Health and Environmental Control (SCDHEC).

USEPA designated Anderson County, South Carolina as a basic nonattainment area for ozone (O₃) under Subpart 1 of the Clean Air Act on April 15, 2004. The effective date of designation is deferred while South Carolina complies with the EAC.

The plan is fiscally constrained and identifies funding sources to the extent possible. SCDHEC prepared base and future emission rates for the vehicle fleet using Mobile 6.2. These rates were applied to VMT from the ANATS travel demand model to estimate emissions.

Introduction

This report documents the regional emissions reduction test, interagency consultation process, public involvement process, and analysis methodology for the emissions analysis completed for the ANATS MPO as part of the Early Action Compact implementation activities.

Regional Emissions Reduction Test

Table 1 shows the results of the baseline test and Table 2 shows the results of the build/no-build test. Both are represented in tons per day (tpd).

Table 1: Baseline Test Emissions

Year	NO _x (tpd)	VOC (tpd)
2000	8.108	4.780
2002	7.703	4.354
2007	5.507	2.940
2030	1.453	1.477

Table 2: Build/No Build Test

Precursor	NO _x (tpd)		VOC (tpd)	
Year	No Build	Build	No Build	Build
2030	1.457	1.453	1.481	1.477

The emissions in each functional classification are calculated using the formula:

$$Emissions_{FC} = DVMT_{FC} \times EmissionsFactor_{FC}$$

Where:

Emissions_{FC} are the emissions in each functional classification,

DVMT is the Daily VMT in each functional classification, and

EmissionsFactor_{FC} is the emissions factor for that functional classification. Emission Factors may be for either NO_x or VOC.

Daily emissions for each scenario are calculated by summing daily emissions across functional classes (in this case Interstates, Freeways, Principal Arterials, Minor Arterials, Collectors and Locals).

Appendix A contains the emission calculation spreadsheets showing the VMT and speed for each functional classification and each scenario.

Scope

The Travel Model covers all of ANATS. All projects in the ANATS Long Range Transportation Plan are included in the Regional Model.

The Travel Demand Model

The South Carolina Department of Transportation provided transportation modeling support to ANATS for the regional emissions analysis. The ANATS travel demand model is a TRANPLAN based travel demand model that includes the trip generation, trip distribution, and trip assignment steps of the travel demand modeling process. The model uses the gravity model for trip distribution and the equilibrium trip assignment algorithm to assign traffic. The model does not include feedback loops from trip assignment to either trip generation or trip distribution. ANATS/SCDOT last validated the model against ground counts in 2002. For the regional emissions analysis ANATS/SCDOT estimated trip tables for 2007 and 2030 by interpolation. Build and No-Build highway networks for the plan horizon year were also created. Table 3 and Figure 1 show the model calibration summary for the ANATS model. A more complete discussion of the travel demand model is included in the ANATS Long-Range Transportation Plan Report.

Table 3: Model Calibration Statistics

Sub-Area	2000 Traffic Count	Assigned Volume	Ratio
North	81,300	73,000	0.90
East	47,500	40,726	0.86
South	23,250	21,135	0.91
Central	1,022,805	1,025,243	1.00
TOTAL	1,174,855	1,160,104	0.99

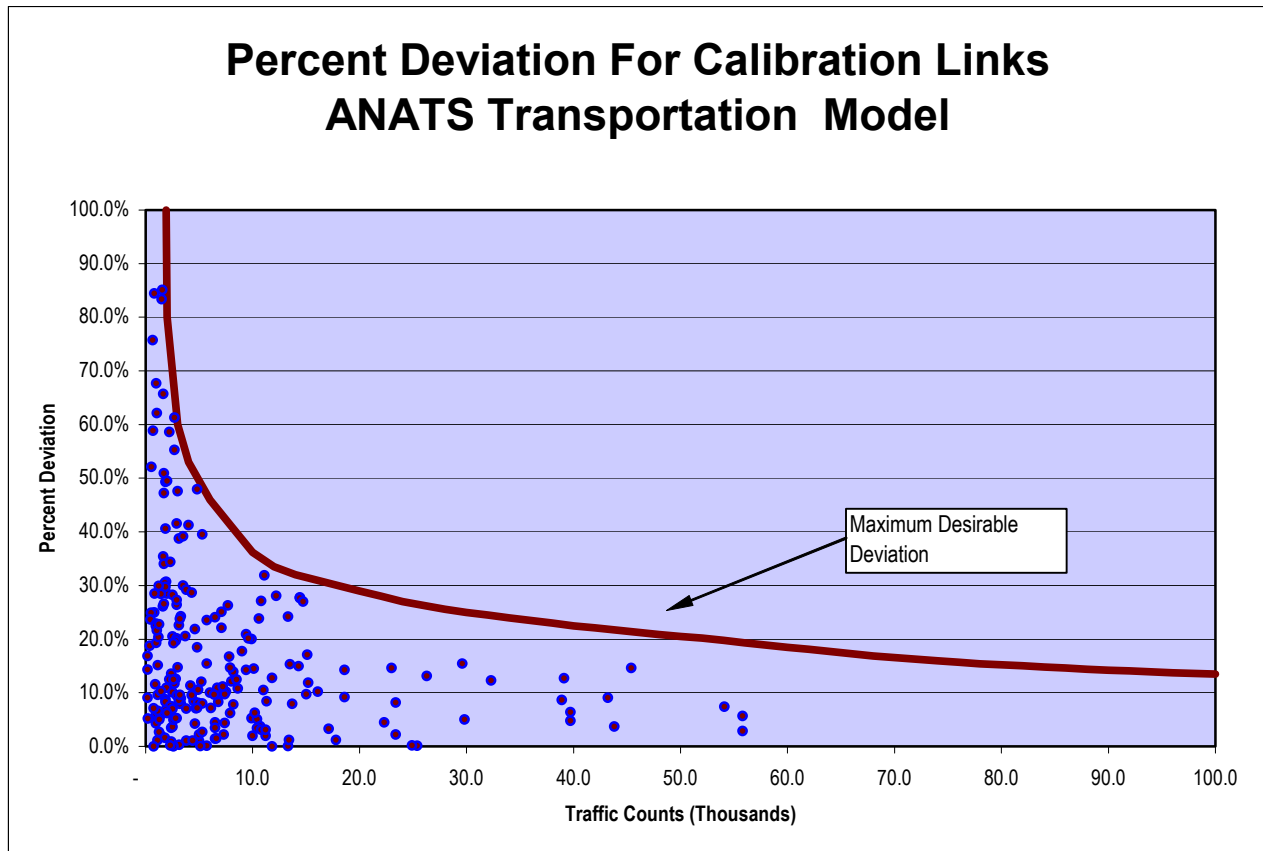


Figure 1: Percent Deviation for Calibration Links

The Emissions Model

The South Carolina Department of Health and Environmental Control (SCDHEC) performed emissions modeling using EPA's latest emissions model, MOBILE6.2. SCDHEC developed MOBILE 6.2 input files using a mix of national default data and locally collected data. The Greenville- Spartanburg International Airport temperatures for the dates of the 10 highest ozone readings at the Powdersville monitor were used to develop minimum and maximum temperature values for the analysis. The primary Mobile 6.2 local input parameters for this report include:

1. Minimum/maximum temperatures (65.9, 90.7).
2. Fuel Reid Vapor Pressure (9.0 psi).
3. No refueling.
Emissions that occur during refueling are excluded from the emission estimates.
4. Average speed.
5. Vehicle Miles Traveled by Facility.

Appendix D includes the MOBILE 6.2 files.

Air Quality Planning

USEPA declared Anderson County, South Carolina basic nonattainment for ozone under Subpart 1 of the Clean Air Act on April 15, 2004. The effective date of designation is deferred while South Carolina complies with the EAC. Figure 2 at right shows the Anderson County ozone nonattainment area.

Anderson County joined SCDHEC in an EAC SIP to demonstrate a reduction of air pollutants without the prescriptive requirements of a non-attainment SIP. The EAC includes a plan for reducing ozone precursors to a level that demonstrates compliance with the NAAQS by December 31, 2007, and maintains the standard through 2017.

SCDHEC, SCDOT EPA, FHWA and FTA, in coordination with nonattainment area MPOs, developed the "Smart Highways" program to produce on-road mobile source emissions analyses, including this ANATS emissions analysis.

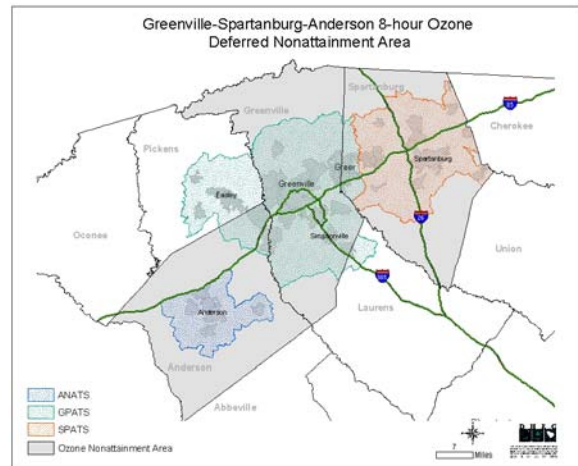


Figure 2: Ozone nonattainment area

Transportation Planning

The 2030 Long Range Transportation Plan for ANATS is an update of the previous long-range transportation plan. The socioeconomic data and fiscal constraint elements of this LRTP include forecasts to the Design Year 2030.

Financial Constraint

The ANATS fiscally constrained Long-Range Transportation Plan is based on historic and anticipated funding availability. Within the plan, ANATS has identified funding sources, and associated them with projects to the extent possible. In addition debt service has been included in estimating future funding streams. Between now and 2030 the expected funding stream is approximately \$2.2 million per year. After accounting for debt service the total funding estimate is \$34.6 million by 2030. These transportation networks are described in Appendix B of this report and in the ANATS 2030 Long Range Transportation Plan.

Latest Planning Assumptions

ANATS developed its 2030 long-range transportation plan with the latest planning assumptions. Population and employment were developed using a step down method to develop regional control totals and then distributing population and employment by classification to individual traffic analysis zones. ANATS staff used expert panels to assist in developing the control totals and the intensity of development in each traffic analysis zone. Figure 3 summarizes the population and employment data for each horizon year of the travel demand model.

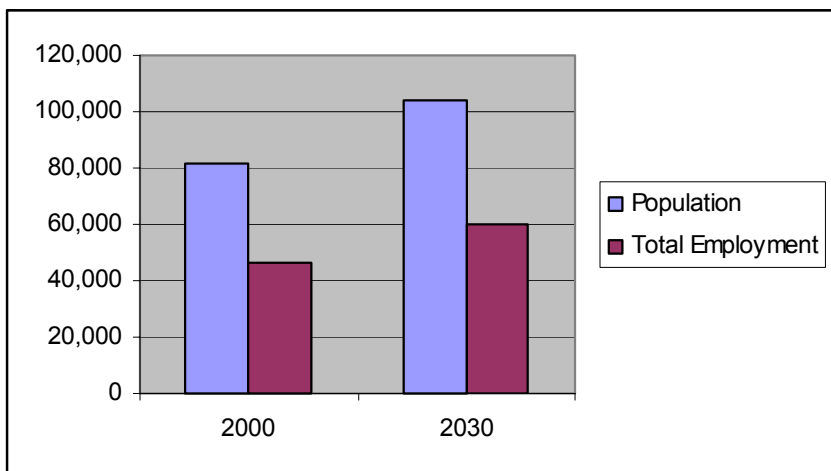


Figure 3: ANATS Population & Employment

Interagency Consultation

The documentation in this report was the subject of interagency consultation. Interagency consultation began in January 2003 and continued through completion of the emissions analysis with regular meetings to discuss and agree upon schedules, model parameters, latest planning assumptions, horizon years, exempt projects, and regionally significant projects. Copies of notes from these meetings are included in Appendix C of this report.

Public Involvement

ANATS handled public review of this report in accordance with the MPO's public involvement policy. A copy of this policy is available from the MPO. A key element of the public involvement process is a public review of transportation planning documents including the Long-Range Transportation Plan.

Conclusion

Based on the analysis and consultation discussed above the emissions expected from implementing the proposed 2030 ANATS long-range transportation plan are less than emissions from either the baseline case or the no build case.

Appendix A: Emission Calculation Spreadsheets

Table 1: Summary Table Less Than Base Line Test

Year	NO _x	VOC
2000	8.108	4.779
2002	7.703	4.354
2007	5.507	2.940
2030	1.453	1.477

Table 2: No Build/Build Summary Table

Year	NO _x		VOC	
	No Build	Build	No Build	Build
2030	1.457	1.453	1.481	1.477

Table 3: 2002 Baseline Emission Calculation

	Speed (mph)	DVMT	NO _x EF (g/mi)	NO _x (tpd)	VOC EF (g/mi)	VOC (tpd)
Interstate (Freeway)	60.73	636,964.06	3.513	2.466	1.354	0.950
Principle Arterial Divided	41.79	46,397.75	2.420	0.124	1.472	0.075
Principle Arterial Undivided	44.81	954,614.48	2.465	2.593	1.445	1.520
Minor Arterial Undivided	38.84	391,502.01	2.381	1.027	1.501	0.648
Collector Divided	45.56	3,796.58	2.482	0.010	1.438	0.006
Collector Undivided	37.44	365,757.10	2.371	0.956	1.517	0.611
Local	20.06	195,953.71	2.438	0.526	2.513	0.543
Daily Total NO_x				7.703	Daily Total VOC	4.354

Table 4: 2007 Emission Calculation

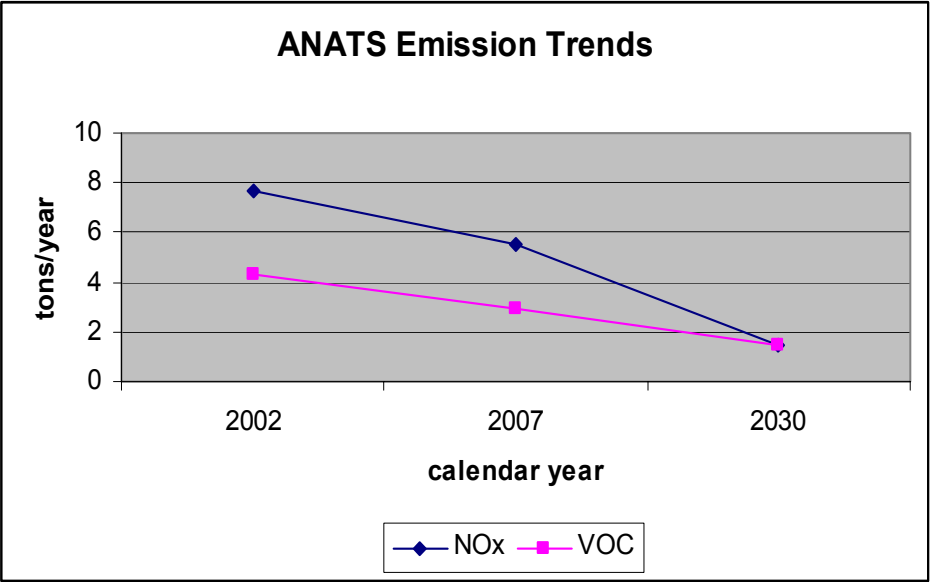
	Speed (mph)	DVMT	NO _x EF (g/mi)	NO _x (tpd)	VOC EF (g/mi)	VOC (tpd)
Interstate (Freeway)	64.00	706,695.49	2.285	1.780	0.851	0.663
Principle Arterial Divided	45.00	46,910.59	1.618	0.084	0.920	0.048
Principle Arterial Undivided	45.00	1,003,937.67	1.618	1.790	0.920	1.018
Minor Arterial Undivided	44.00	431,501.90	1.608	0.765	0.925	0.440
Collector Divided	46.00	4,069.08	1.637	0.007	0.914	0.004
Collector Undivided	43.00	393,959.73	1.597	0.693	0.931	0.404
Local	20.00	209,581.62	1.680	0.388	1.575	0.364
Daily Total NO_x				5.507	Daily Total VOC	2.940

Table 5: Build/No-Build Analysis for NO_x

2030 NO _x Emissions									
Functional Classification	Speed (mph)	No Build			Speed (mph)	Build			
		DVMT	NO _x EF (g/mi)	No Build NO _x (tpd)		DVMT	NO _x EF (g/mi)	Build NO _x (tpd)	
Interstate (Freeway)	60.73	1,042,801.51	.392	0.450	60.73	1,041,261.90	.392	0.450	
Principle Arterial Divided	42.08	52,783.16	.328	0.019	42.07	50,513.20	.328	0.018	
Principle Arterial Undivided	44.91	1,361,412.72	.332	0.498	44.88	1,346,930.60	.332	0.493	
Minor Arterial Undivided	39.45	567, 213.05	.324	0.203	39.45	563,330.35	.324	0.201	
Collector Divided	45.00	3,593.39	.332	0.001	45.00	3,591.26	.332	0.001	
Collector Undivided	37.94	527,686.36	.323	0.188	38.08	539,296.97	.323	0.192	
Local	20.00	259,012.26	.342	0.098	20.00	258,551.70	.342	0.097	
Total NO _x				1.457	Total NO _x				1.453

Table 6: Build/No Build Analysis for VOC

2030 VOC Emissions								
Functional Classification	Speed (mph)	No Build			Speed (mph)	Build		
		DVMT	VOC EF (g/mi)	No Build VOC (tpd)		DVMT	VOC EF (g/mi)	Build VOC (tpd)
Interstate (Freeway)	60.73	1,042,801.51	0.316	0.363	60.73	1,041,261.90	0.316	0.363
Principle Arterial Divided	42.08	52,783.16	0.341	0.020	42.07	50,513.20	0.341	0.019
Principle Arterial Undivided	44.91	1,361,412.72	0.335	0.503	44.88	1,346,930.60	0.335	0.497
Minor Arterial Undivided	39.45	567,213.05	0.347	0.217	39.45	563,330.35	0.347	0.215
Collector Divided	45.00	3,593.39	0.335	0.001	45.00	3,591.26	0.335	0.001
Collector Undivided	37.94	527,686.36	0.351	0.204	38.08	539,296.97	0.351	0.209
Local	20.00	259,012.26	0.607	0.173	20.00	258,551.70	0.607	0.173
Total VOC				1.481	Total VOC 1.477			



Appendix B: Project Description Table

Projects Under Construction or Programmed in TIP		
ID	Project and Description	Travel Model Network Status
1	Clemson Boulevard (US 76/178) - Widen from 5 to 7 lanes from Stephens Rd to Birch Str	2002
2	SC 28 Bypass - Widen from 2 to 5 lanes from McGee Rd to US 178	2002
3	SC 24 - Widen from 2 to 5 lanes from SC 28BP to SC 187	2007
4	SC 81 - Widen from 2 to 5 lanes from T.L. Hanna HS to I-85	2002
5	Michelin Boulevard – new construction	2000
6	Master Boulevard –new construction	2000
7	East-West Connector - New location from Clemson Blvd (US 76/178) to SC 81	2007

Long Range Plan Projects		
ID	Project and Description	Travel Model Network Status
1	Civic Center Boulevard - Widen from 2 to 5 lanes from Clemson Blvd (US 76/178) to Mall Road	2030
2	Whitehall Road - Widen from 2 to 3 lanes from SC 28 BP to SC 24	2030
3	US 29 - Widen from 2 to 3 lanes from US 29 Business to Broadway School Rd	2030
4	Boulevard, Main, North Ave. Intersection	2030
5	Reed, Concord, Kings Intersection	2030

Appendix C: Interagency Consultation Meeting Minutes and Agency Comments

Smart Highways Workgroup Updates

January 27, 2003 – Initial meeting held between EPA, FHWA, DOT, and DHEC. DOT and FHWA are to work out involving the MPOs. Group feels it will be beneficial to implement some conformity type processes (lack of better word) – and formed a workgroup. The workgroup held a conference call – DOT is putting together some information concerning the technical process and will submit it for review.

February 10, 2003 – Workgroup has been getting input from the counties and the MPOs about the process.

March 3, 2003 – John Gardner with DOT has some ideas out for starting points. Group has reviewed and will discuss during the next conference call.

March 17, 2003 – Group decided that approach is a good idea. John Gardner and Dan Hinton are going to evaluate the conformity checklist for items that can be pulled for approach. John is also going to check for an inventory of what VMT information is available. Tonya, Melinda and Henry are drafting the process for the agencies to follow based on priority given to non-attainment areas to include a “what if” approach. Lynorae had some comments from EPA that she is going to provide in the next day or so. All of these deliverables are to be completed by March 21st. After everyone has reviewed, we will set up another conference call.

March 24, 2003 – Waiting on John Gardner and Dan Hinton to evaluate the conformity checklist for items that can be pulled for approach. Also waiting on John to check for an inventory of what VMT information is available. We (DHEC) have drafted and sent out to the rest of the group a process for the agencies to follow based on priority given to non-attainment areas to include a “what if” approach. After everyone has reviewed, we will set up another conference call to discuss.

April 7, 2003 – Discussed proposals and checklist developed by participants. Lynorae Benjamin (EPA) was unable to participate on call, which limited some of the discussion, but we have since caught up via individual phone messages. John Gardner (DOT) will be drafting a plan from the DOT perspective for the group to be delivered in two weeks.

April 14, 2003 – Awaiting a draft plan from John Gardner at DOT.

May 27, 2003 – The Southern Environmental Law Center is very interested in participating in this approach and has submitted a letter with their concerns. Several of the MPOs have also expressed an interest in being involved as well. Once John has completed draft, we will reconvene and will certainly welcome the additional stakeholders.

August 18, 2003 – John Gardner has provided transportation plans from several MPOs to potentially be used as a guide.

August 25, 2003 – John will send a smart highways checklist around to folks by next week. Lynorae will develop a “flowchart”, to include “what ifs”. She will send it out by September 5th. The group will review the documents and get back together on September 10th for another call.

September 1, 2003 – A conference call will be held on Wednesday, September 10th.

September 8, 2003 – The group is currently awaiting the review of the *GRATS long-range transportation document. We plan to possibly meet on October 8th for our next discussion. (*GRATS will be referred to later as GPATS due to changes in their organizational boundary)

January 30, 2004 – A meeting is scheduled for February 12th here in Columbia. We will discuss the conformity process and develop a Smart Highways approach.

February 27, 2004 – There was representation by DHEC, EPA, MPOs, FHWA, and DOT during the meeting held February 12th. There were several presentations at the meeting and we discussed the conformity process and the Smart Highways approach.

August 27, 2004 – FHWA sent out checklist to group and a conference call was held with DOT, FHWA, EPA, and MPOs on September 2nd to finalize checklist. Sent out new version of checklist today. Inter-agency partners will have upper management review. Plan is to share with Southern Environmental Law Center in the next couple of weeks for their comments. Additionally, DHEC has drafted language addressing the checklist to be placed in the EAC SIP.

September 30, 2004 – Awaiting comments from SELC.

October 29, 2004 – Finalized and out on public comment with the rest of EAC stuff.

January 31, 2005 – Meeting to discuss status and make preparations for EAC obligations.

February 25, 2005 – Awaiting submittal of VMT and speed data from the 4 MPOs. It is due March 16th.

March 31, 2005 – We have received VMT and speed data from GPATS, ANATS, and COATS. That data will be placed into Mobile 6 so that an emissions analysis can be completed. We are still awaiting SPATS.

April 29, 2005 – We have received VMT and speed data from all the MPOs and are completing Mobile 6 baseline analysis.

May 31, 2005 – The Smart Highways analyses were completed. Currently, the MPOs, DOT, and DHEC are writing up the associated reports.

June 30, 2005 – June 27th we sent reports rewrites to DOT. On July 7th we met with DOT and the MPOs to answer questions about the report. Our target completion date for the reports is August 1st.

July 29, 2005 – We are still finalizing the assessment documents for each area.

August 31, 2005 – Have made some changes to the Smart Highways Reports. Awaiting feedback from COATS.

September 29, 2005 – DHEC completed review of reports and redistributed them as final drafts.

Appendix D: MOBILE 6.2 Files

```
*****
* MOBILE6.2.03 (24-Sep-2003) *
* Input file: LNAT2K2P.IN (file 1, run 1). *
*****
```

```
M616 Comment:
      User has supplied post-1999 sulfur levels.
M603 Comment:
      User has disabled the calculation of REFUELING emissions.
```

```
* #####
* ANATS 2002 BASELINE - Freeway 60.73 MPH
* File 1, Run 1, Scenario 1.
* #####
```

```
M582 Warning:
      The user supplied freeway average speed of 60.7
      will be used for all hours of the day. 100% of VMT
      has been assigned to a fixed combination of freeways
      and freeway ramps for all hours of the day and all
      vehicle types.
```

```
M 48 Warning:
      there are no sales for vehicle class HDGV8b
```

```
      Calendar Year: 2002
      Month: July
      Altitude: Low
      Minimum Temperature: 65.9 (F)
      Maximum Temperature: 90.7 (F)
      Absolute Humidity: 75. grains/lb
      Nominal Fuel RVP: 9.0 psi
      Weathered RVP: 8.6 psi
      Fuel Sulfur Content: 279. ppm
```

```
      Exhaust I/M Program: No
      Evap I/M Program: No
      ATP Program: No
      Reformulated Gas: No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.4568	0.3091	0.1063		0.0360	0.0008	0.0017	0.0833	0.0060	1.0000

Composite Emission Factors (g/mi):										
Composite VOC :	1.277	1.388	2.215	1.600	1.377	0.581	0.779	0.455	2.80	1.354
Composite NOX :	1.257	1.492	1.845	1.582	5.904	2.500	2.584	24.650	1.63	3.513

```
M583 Warning:
    The user supplied arterial average speed of 41.8
    will be used for all hours of the day. 100% of VMT
    has been assigned to the arterial/collector roadway
    type for all hours of the day and all vehicle types.
M 48 Warning:
    there are no sales for vehicle class HDGV8b
```

Exhaust I/M Program:	No
Evap I/M Program:	No
ATP Program:	No
Reformulated Gas:	No

```
* #####
```

```
* ANATS 2002 BASELINE - PRINCIPAL ART UNDIVIDED 44.81 MPH
```

```
* File 1, Run 1, Scenario 3.
```

```
* #####
```

Calendar Year: 2002

Month: July
 Altitude: Low
 Minimum Temperature: 65.9 (F)
 Maximum Temperature: 90.7 (F)
 Absolute Humidity: 75. grains/lb
 Nominal Fuel RVP: 9.0 psi
 Weathered RVP: 8.6 psi
 Fuel Sulfur Content: 279. ppm

Exhaust I/M Program: No
 Evap I/M Program: No
 ATP Program: No

Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
VMT Distribution:	0.4568	0.3091	0.1063		0.0360	0.0008	0.0017	0.0833	0.0060	1.0000

Composite Emission Factors (g/mi):										
Composite VOC :	1.357	1.483	2.386	1.715	1.527	0.612	0.819	0.505	2.26	1.445
Composite NOX :	1.175	1.380	1.733	1.471	5.234	1.459	1.505	13.423	1.19	2.465

* #
 * ANATS 2002 BASELINE - MINOR ARTERIAL UNDIVIDED 38.84 MPH
 * File 1, Run 1, Scenario 4.
 * #

M583 Warning:
 The user supplied arterial average speed of 38.8
 will be used for all hours of the day. 100% of VMT
 has been assigned to the arterial/collector roadway
 type for all hours of the day and all vehicle types.
 M 48 Warning:
 there are no sales for vehicle class HDGV8b

Calendar Year: 2002
 Month: July
 Altitude: Low
 Minimum Temperature: 65.9 (F)
 Maximum Temperature: 90.7 (F)
 Absolute Humidity: 75. grains/lb
 Nominal Fuel RVP: 9.0 psi
 Weathered RVP: 8.6 psi
 Fuel Sulfur Content: 279. ppm

Exhaust I/M Program: No
 Evap I/M Program: No
 ATP Program: No
 Reformulated Gas: No

```
* #####
* ANATS 2002 BASELINE - COLLECTOR DIVIDED 45.56 MPH
* File 1, Run 1, Scenario 5.
* #####
M583 Warning:
    The user supplied arterial average speed of 45.6
    will be used for all hours of the day. 100% of VMT
    has been assigned to the arterial/collector roadway
    type for all hours of the day and all vehicle types.
M 48 Warning:
    there are no sales for vehicle class HDGV8b
```

Calendar Year:	2002
Month:	July
Altitude:	Low
Minimum Temperature:	65.9 (F)
Maximum Temperature:	90.7 (F)
Absolute Humidity:	75. grains/lb
Nominal Fuel RVP:	9.0 psi
Weathered RVP:	8.6 psi
Fuel Sulfur Content:	279. ppm

Exhaust I/M Program:	No
Evap I/M Program:	No
ATP Program:	No
Reformulated Gas:	No

```
* #####
* ANATS 2002 BASELINE - COLLECTOR UNDIVIDED 37.44 MPH
* File 1, Run 1, Scenario 6.
* #####
```

The user supplied arterial average speed of 37.4 will be used for all hours of the day. 100% of VMT has been assigned to the arterial/collector roadway type for all hours of the day and all vehicle types.

```
there are no sales for vehicle class HDGV8b
```

Calendar Year:	2002
Month:	July
Altitude:	Low
Minimum Temperature:	65.9 (F)
Maximum Temperature:	90.7 (F)
Absolute Humidity:	75. grains/lb
Nominal Fuel RVP:	9.0 psi
Weathered RVP:	8.6 psi
Fuel Sulfur Content:	279. ppm

Exhaust I/M Program:	No
Evap I/M Program:	No
ATP Program:	No
Reformulated Gas:	No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
VMT Distribution:	0.4568	0.3091	0.1063		0.0360	0.0008	0.0017	0.0833	0.0060	1.0000

Composite Emission Factors (g/mi):

Composite VOC :	1.424	1.541	2.476	1.780	1.722	0.658	0.880	0.580	2.35	1.517
Composite NOX :	1.157	1.352	1.706	1.443	4.961	1.363	1.406	12.649	1.16	2.371

* #

* ANATS 2002 BASELINE - LOCAL 20.06 MPH

* File 1, Run 1, Scenario 7.

* #

* Reading Hourly Roadway VMT distribution from the following external

```
* data file: C:\MOBILE6\RUN\FVMTLOCL.D
```

Reading User Supplied ROADWAY VMT Factors

M 48 Warning:

```
there are no sales for vehicle class HDGV8b
```

Calendar Year: 2002
Month: July
Altitude: Low
Minimum Temperature: 65.9 (F)
Maximum Temperature: 90.7 (F)
Absolute Humidity: 75. grains/lb
Nominal Fuel RVP: 9.0 psi
Weathered RVP: 8.6 psi

```
Exhaust I/M Program: No
  Evap I/M Program: No
    ATP Program: No
  Reformulated Gas: No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
VMT Distribution:	0.4568	0.3091	0.1063		0.0360	0.0008	0.0017	0.0833	0.0060	1.0000

Composite VOC :	2.352	2.428	3.760	2.769	4.338	1.095	1.461	1.298	3.46	2.513
Composite NOX :	1.176	1.309	1.670	1.401	4.027	1.803	1.862	13.972	0.91	2.438

```
* #####
* ANATS 2007 - Freeway 60.73 MPH
* File 1, Run 1, Scenario 1.
* #####
```

```
M 48 Warning:
      there are no sales for vehicle class HDGV8b
```

6

Nominal Fuel RVP: 9.0 psi
 Weathered RVP: 8.6 psi
 Fuel Sulfur Content: 33. ppm

Exhaust I/M Program: No
 Evap I/M Program: No
 ATP Program: No
 Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
VMT Distribution:	0.3872	0.3600	0.1237		0.0359	0.0004	0.0019	0.0854	0.0056	1.0000

Composite Emission Factors (g/mi):										
Composite VOC :	0.797	0.837	1.354	0.970	0.846	0.283	0.496	0.313	2.79	0.851
Composite NOX :	0.771	0.985	1.363	1.081	3.943	1.309	1.676	15.342	1.63	2.285

* #####
 * ANATS 2007 - Principal Art Divided 45.00 MPH
 * File 1, Run 1, Scenario 2.
 * #####

M583 Warning:
 The user supplied arterial average speed of 45.0
 will be used for all hours of the day. 100% of VMT
 has been assigned to the arterial/collector roadway
 type for all hours of the day and all vehicle types.

M 48 Warning:
 there are no sales for vehicle class HDGV8b

Calendar Year: 2007
 Month: July
 Altitude: Low
 Minimum Temperature: 65.9 (F)
 Maximum Temperature: 90.7 (F)
 Absolute Humidity: 75. grains/lb
 Nominal Fuel RVP: 9.0 psi
 Weathered RVP: 8.6 psi
 Fuel Sulfur Content: 33. ppm

Exhaust I/M Program: No
 Evap I/M Program: No
 ATP Program: No
 Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
VMT Distribution:	0.3872	0.3600	0.1237		0.0359	0.0004	0.0019	0.0854	0.0056	1.0000

Composite Emission Factors (g/mi):										

Composite VOC :	0.867	0.902	1.474	1.049	0.940	0.297	0.523	0.346	2.25	0.920
Composite NOX :	0.722	0.913	1.280	1.007	3.500	0.764	0.977	8.403	1.19	1.618

* #####
 * ANATS 2007 - PRINCIPAL ART UNDIVIDED 45.00 MPH
 * File 1, Run 1, Scenario 3.
 * #####

M583 Warning:
 The user supplied arterial average speed of 45.0
 will be used for all hours of the day. 100% of VMT
 has been assigned to the arterial/collector roadway
 type for all hours of the day and all vehicle types.

M 48 Warning:
 there are no sales for vehicle class HDGV8b

Calendar Year: 2007
 Month: July
 Altitude: Low
 Minimum Temperature: 65.9 (F)
 Maximum Temperature: 90.7 (F)
 Absolute Humidity: 75. grains/lb
 Nominal Fuel RVP: 9.0 psi
 Weathered RVP: 8.6 psi
 Fuel Sulfur Content: 33. ppm

Exhaust I/M Program: No
 Evap I/M Program: No
 ATP Program: No
 Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
VMT Distribution:	0.3872	0.3600	0.1237		0.0359	0.0004	0.0019	0.0854	0.0056	1.0000

Composite Emission Factors (g/mi):

Composite VOC :	0.867	0.902	1.474	1.049	0.940	0.297	0.523	0.346	2.25	0.920
Composite NOX :	0.722	0.913	1.280	1.007	3.500	0.764	0.977	8.403	1.19	1.618

* #####
 * ANATS 2007 - MINOR ARTERIAL UNDIVIDED 44.00 MPH
 * File 1, Run 1, Scenario 4.
 * #####

M583 Warning:
 The user supplied arterial average speed of 44.0
 will be used for all hours of the day. 100% of VMT
 has been assigned to the arterial/collector roadway
 type for all hours of the day and all vehicle types.

M 48 Warning:
 there are no sales for vehicle class HDGV8b

Exhaust I/M Program:	No
Evap I/M Program:	No
ATP Program:	No
Reformulated Gas:	No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VTM Distribution:	0.3872	0.3600	0.1237		0.0359	0.0004	0.0019	0.0854	0.0056	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.873	0.907	1.481	1.054	0.952	0.300	0.527	0.352	2.25	0.925
Composite NOX :	0.720	0.910	1.277	1.004	3.477	0.756	0.967	8.317	1.19	1.608

```
* #####
* ANATS 2007 - COLLECTOR DIVIDED 46.00 MPH
* File 1, Run 1, Scenario 5.
* #####
```

The user supplied arterial average speed of 46.0 will be used for all hours of the day. 100% of VMT has been assigned to the arterial/collector roadway type for all hours of the day and all vehicle types.

```
there are no sales for vehicle class HDGV8b
```

Exhaust I/M Program:	No
Evap I/M Program:	No
ATP Program:	No
Reformulated Gas:	No

```
* #####
* ANATS 2007 - COLLECTOR UNDIVIDED 43.00 MPH
* File 1, Run 1, Scenario 6.
* #####
M583 Warning:
    The user supplied arterial average speed of 43.0
    will be used for all hours of the day. 100% of VMT
    has been assigned to the arterial/collector roadway
    type for all hours of the day and all vehicle types.
M 48 Warning:
    there are no sales for vehicle class HDGV8b
```

Calendar Year:	2007
Month:	July
Altitude:	Low
Minimum Temperature:	65.9 (F)
Maximum Temperature:	90.7 (F)
Absolute Humidity:	75. grains/lb
Nominal Fuel RVP:	9.0 psi
Weathered RVP:	8.6 psi
Fuel Sulfur Content:	33. ppm

Exhaust I/M Program:	No
Evap I/M Program:	No
ATP Program:	No
Reformulated Gas:	No

```
* #####
* ANATS 2007 - LOCAL 20.00 MPH
* File 1, Run 1, Scenario 7.
* #####
```


Exhaust I/M Program:	No
Evap I/M Program:	No
ATP Program:	No
Reformulated Gas:	No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VTMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.290	0.343	0.488	0.380	0.222	0.040	0.095	0.184	2.26	0.341
Composite NOX :	0.218	0.311	0.466	0.351	0.193	0.024	0.112	0.534	1.18	0.328

```

* #####
* ANATS 2030 NO-BUILD - PRINCIPAL ART UNDIVIDED 44.91 MPH
* File 1, Run 1, Scenario 3.
* #####
M583 Warning:
    The user supplied arterial average speed of 44.9
    will be used for all hours of the day. 100% of VMT
    has been assigned to the arterial/collector roadway
    type for all hours of the day and all vehicle types.
M 48 Warning:
    there are no sales for vehicle class HDGV8b
M 48 Warning:
    there are no sales for vehicle class LDDT12

```

Exhaust I/M Program:	No
Evap I/M Program:	No
ATP Program:	No
Reformulated Gas:	No

[illegible]

Absolute Humidity: 75. grains/lb
 Nominal Fuel RVP: 9.0 psi
 Weathered RVP: 8.6 psi
 Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: No
 Evap I/M Program: No
 ATP Program: No
 Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
VTM Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000

Composite Emission Factors (g/mi):										
Composite VOC :	0.301	0.351	0.498	0.388	0.240	0.042	0.100	0.199	2.31	0.351
Composite NOX :	0.216	0.307	0.461	0.347	0.187	0.024	0.108	0.515	1.16	0.323

* #
 * ANATS 2030 NO-BUILD - LOCAL 20.00 MPH
 * File 1, Run 1, Scenario 7.
 * #

* Reading Hourly Roadway VMT distribution from the following external
 * data file: C:\MOBILE6\RUN\FVMTLOCL.D

Reading User Supplied ROADWAY VMT Factors

M 48 Warning:
 there are no sales for vehicle class HDGV8b
 M 48 Warning:
 there are no sales for vehicle class LDDT12

Calendar Year: 2030
 Month: July
 Altitude: Low
 Minimum Temperature: 65.9 (F)
 Maximum Temperature: 90.7 (F)
 Absolute Humidity: 75. grains/lb
 Nominal Fuel RVP: 9.0 psi
 Weathered RVP: 8.6 psi
 Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: No
 Evap I/M Program: No
 ATP Program: No
 Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

VMT Distribution:	0.2788	0.4388	0.1507	0.0365	0.0003	0.0022	0.0876	0.0051	1.0000
-------------------	--------	--------	--------	--------	--------	--------	--------	--------	--------

```
*****
* MOBILE6.2.03 (24-Sep-2003) *
* Input file: LNat30P.IN (file 1, run 1). *
*****
```

```
* #####
* ANATS 2030 - Freeway 60.73 MPH
* File 1, Run 1, Scenario 1.
* #####
M582 Warning:
```

```
M 48 Warning:      there are no sales for vehicle class HDGV8b
M 48 Warning:      there are no sales for vehicle class LDdT12
```

Exhaust I/M Program:	No
Evap I/M Program:	No
ATP Program:	No
Reformulated Gas:	No

Composite Emission Factors (g/mi):

Composite VOC :	0.260	0.320	0.449	0.353	0.184	0.036	0.086	0.158	2.77	0.316
Composite NOX :	0.232	0.340	0.506	0.383	0.221	0.043	0.199	0.969	1.63	0.392

* #####
 * ANATS 2030 - Principal Art Divided 42.07 MPH
 * File 1, Run 1, Scenario 2.
 * #####

M583 Warning:
 The user supplied arterial average speed of 42.1
 will be used for all hours of the day. 100% of VMT
 has been assigned to the arterial/collector roadway
 type for all hours of the day and all vehicle types.

M 48 Warning:
 there are no sales for vehicle class HDGV8b

M 48 Warning:
 there are no sales for vehicle class LDDT12

Calendar Year: 2030
 Month: July
 Altitude: Low
 Minimum Temperature: 65.9 (F)
 Maximum Temperature: 90.7 (F)
 Absolute Humidity: 75. grains/lb
 Nominal Fuel RVP: 9.0 psi
 Weathered RVP: 8.6 psi
 Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: No
 Evap I/M Program: No
 ATP Program: No
 Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000

Composite Emission Factors (g/mi):

Composite VOC :	0.290	0.343	0.488	0.380	0.222	0.040	0.095	0.184	2.26	0.341
Composite NOX :	0.218	0.311	0.466	0.351	0.192	0.024	0.112	0.534	1.18	0.328

* #####
 * ANATS 2030 - PRINCIPAL ART UNDIVIDED 44.88 MPH
 * File 1, Run 1, Scenario 3.
 * #####

M583 Warning:
 The user supplied arterial average speed of 44.9
 will be used for all hours of the day. 100% of VMT
 has been assigned to the arterial/collector roadway

type for all hours of the day and all vehicle types.

M 48 Warning:

there are no sales for vehicle class HDGV8b

M 48 Warning:

there are no sales for vehicle class LDDT12

Calendar Year: 2030
Month: July
Altitude: Low
Minimum Temperature: 65.9 (F)
Maximum Temperature: 90.7 (F)
Absolute Humidity: 75. grains/lb
Nominal Fuel RVP: 9.0 psi
Weathered RVP: 8.6 psi
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: No
Evap I/M Program: No
ATP Program: No
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000

Composite Emission Factors (g/mi):										
Composite VOC :	0.283	0.339	0.481	0.375	0.212	0.039	0.092	0.175	2.23	0.335
Composite NOX :	0.219	0.314	0.470	0.354	0.196	0.025	0.115	0.552	1.19	0.332

* #
* ANATS 2030 - MINOR ARTERIAL UNDIVIDED 39.45 MPH
* File 1, Run 1, Scenario 4.
* #

M583 Warning:

The user supplied arterial average speed of 39.5
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.

M 48 Warning:

there are no sales for vehicle class HDGV8b

M 48 Warning:

there are no sales for vehicle class LDDT12

Calendar Year: 2030
Month: July
Altitude: Low
Minimum Temperature: 65.9 (F)
Maximum Temperature: 90.7 (F)
Absolute Humidity: 75. grains/lb
Nominal Fuel RVP: 9.0 psi

Weathered RVP: 8.6 psi
 Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: No
 Evap I/M Program: No
 ATP Program: No
 Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000

Composite Emission Factors (g/mi):										
Composite VOC :	0.297	0.348	0.494	0.385	0.233	0.041	0.098	0.193	2.29	0.347
Composite NOX :	0.217	0.308	0.462	0.348	0.189	0.024	0.108	0.518	1.17	0.324

* #
 * ANATS 2030 - COLLECTOR DIVIDED 45.00 MPH
 * File 1, Run 1, Scenario 5.
 * #
 M583 Warning:

The user supplied arterial average speed of 45.0
 will be used for all hours of the day. 100% of VMT
 has been assigned to the arterial/collector roadway
 type for all hours of the day and all vehicle types.

M 48 Warning:
 there are no sales for vehicle class HDGV8b

M 48 Warning:
 there are no sales for vehicle class LDDT12

Calendar Year: 2030
 Month: July
 Altitude: Low
 Minimum Temperature: 65.9 (F)
 Maximum Temperature: 90.7 (F)
 Absolute Humidity: 75. grains/lb
 Nominal Fuel RVP: 9.0 psi
 Weathered RVP: 8.6 psi
 Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: No
 Evap I/M Program: No
 ATP Program: No
 Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000

Composite Emission Factors (g/mi):

Composite VOC :	0.283	0.339	0.481	0.375	0.212	0.039	0.092	0.175	2.23	0.335
Composite NOX :	0.219	0.315	0.470	0.354	0.196	0.025	0.115	0.553	1.19	0.332

* #####
 * ANATS 2030 - COLLECTOR UNDIVIDED 38.08 MPH
 * File 1, Run 1, Scenario 6.
 * #####

M583 Warning:
 The user supplied arterial average speed of 38.1
 will be used for all hours of the day. 100% of VMT
 has been assigned to the arterial/collector roadway
 type for all hours of the day and all vehicle types.

M 48 Warning:
 there are no sales for vehicle class HDGV8b

M 48 Warning:
 there are no sales for vehicle class LDDT12

Calendar Year: 2030
 Month: July
 Altitude: Low
 Minimum Temperature: 65.9 (F)
 Maximum Temperature: 90.7 (F)
 Absolute Humidity: 75. grains/lb
 Nominal Fuel RVP: 9.0 psi
 Weathered RVP: 8.6 psi
 Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: No
 Evap I/M Program: No
 ATP Program: No
 Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000

Composite Emission Factors (g/mi):

Composite VOC :	0.301	0.350	0.498	0.388	0.239	0.042	0.100	0.199	2.31	0.351
Composite NOX :	0.216	0.307	0.461	0.347	0.187	0.024	0.108	0.515	1.16	0.323

* #####
 * ANATS 2030 - LOCAL 20.00 MPH
 * File 1, Run 1, Scenario 7.
 * #####

* Reading Hourly Roadway VMT distribution from the following external
 * data file: C:\MOBILE6\RUN\FVMTLOCL.D

Reading User Supplied ROADWAY VMT Factors

M 48 Warning:

there are no sales for vehicle class HDGV8b

M 48 Warning:

there are no sales for vehicle class LDDT12

Calendar Year: 2030
Month: July
Altitude: Low
Minimum Temperature: 65.9 (F)
Maximum Temperature: 90.7 (F)
Absolute Humidity: 75. grains/lb
Nominal Fuel RVP: 9.0 psi
Weathered RVP: 8.6 psi
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: No
Evap I/M Program: No
ATP Program: No
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000

Composite Emission Factors (g/mi):										
Composite VOC :	0.545	0.581	0.798	0.636	0.601	0.077	0.183	0.451	3.44	0.607
Composite NOX :	0.237	0.311	0.453	0.347	0.151	0.031	0.143	0.690	0.91	0.342
